REMARKS

Applicant intends this response to be a complete to the Examiner's **13 January 2011** Non-Final Office Action.

Continued Examination Under 37 CFR 1.114

The Examiner states and/or contends as follows:

> 1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's Amendments and Accompanying Remarks filed on October 06,2010 has been entered and carefully considered. Claims 1 - 44,67 - 95 and 97 have been canceled. New claims 98 -118 have been added. In view of argument and amendment, the Examiner has withdrawn the rejection of claims 49 - 55 and 96 over Momose as detailed in the Office Action dated July 06, 2010. The invention as currently claimed is not found to be patentable for reasons herein below.

Applicants acknowledge the Examiner's statements.

Claim Rejections - 35 USC § 102

3. **Claims 49-66, 96 and 98-118** stand rejected under 35 U.S.C. 102 (b) as being unpatentable over Perez et al. US Patent No 6,630,231 82

The Examiner states and/or contends as follows:

> 4. Considering claims 49 - 66, 96 and 98 - 118, Perez et al. teaches composite articles having a polymeric bulk or matrix phase and a polymeric reinforcement phase comprising polymeric microfibers. The microfibers can be provided by forming highly oriented, semi-crystalline, polymeric films or foams, followed by partially or totally microfibrillating the highly oriented film, thereby forming the microfibers [Col. 2, lines 13-18].
>
> Furthermore, Perez et al. also teaches that Polymers useful in forming the microfibers include any melt-processable crystalline, semicrystalline or crystallizable polymers. Semicrystalline polymers consist of a mixture of amorphous regions and crystalline regions. The crystalline regions are more ordered and segments of the chains actually pack in crystalline lattices. Some polymers can be made semicrystalline by heat treatments, stretching or orienting, and by solvent inducement, and these processes can control the degree of true crystallinity. Semicrystalline polymers useful in the present invention include, but are not limited to, high and low density polyethylene, polypropylene, and thermotropic liquid crystal polymers [Col. 3, lines 10 - 20].
>
> Moreover, Perez et al. also teaches that Useful polymers preferably are those that can undergo processing to impart a high orientation ratio in a manner that enhances their mechanical integrity, and are semi-crystalline in nature. Orienting semicrystalline polymers significantly improves the strength and elastic modulus in the orientation direction, and orientation of a semicrystalline polymer below its melting point results in an oriented crystalline phase with fewer chain folds and defects. The most effective temperature range for orienting semicrystalline polymers is between the alpha crystallization temperature of the polymer and its melting point. The alpha crystallization temperature, or alpha transition temperature, corresponds to a secondary transition of the polymer at which crystal sub-units can be moved within the larger crystal unit. Preferred polymers in this aspect therefore are those that exhibit an alpha transition temperature (T.sub .. alpha.c) and include, for example: high density polyethylene, linear low density polyethylene, ethylene alpha-olefin copolymers, polypropylene. Particularly preferred polymers in this aspect have melting temperatures greater than 140 degree C and blends of such polymers with lower temperature melting polymers [Col. 3, lines 35-

64].

Furthermore, Perez et al. also discloses that upon orientation, voids are imparted to the film. As the film is stretched, the two components separate due to the immiscibility of the two components and poor adhesion between the two phases. When the film comprise a continuous phase and a discontinuous phase, the discontinuous phase serves to initiate voids which remain as substantially discrete, discontinuous voids in the matrix of the continuous phase [Col. 7, lines 43 - 50].

Moreover, Perez et al. also teaches that after orientation the cells are relatively planar in shape and have distinct boundaries. Cells are generally coplanar with the major surfaces of the foam. with major axes in the machine (X) and transverse (Y) directions (directions of orientation). The sizes of the cells are substantially uniform and dependent on concentration of blowing agent. extrusion conditions and degree of orientation [Col. 10, lines 53 - 68].

Perez et al. also teaches that the microfibers generally have an effective average diameter less than about 20 microns, and can have an effective average diameter ranging from about 0.01 microns to about 10 microns. preferably 0.1 to 5 microns. and are substantially rectangular in cross section. As the microfibers are usually substantially rectangular. the effective diameter may be a measure of the average value of the width and thickness of the fibers. Some microfibers have a Transverse Aspect Ratio of from 1.5:1 to 20:1. while other microfibers have a transverse aspect ratio of between about 3: 1 to 9: 1 [Col. 12, lines 10 - 20], thus anticipating all limitations in the instant claims.

Applicant's attorney has run across many patents, but few are as difficult to read and understand as this one.

First, Perez et al **is not directed to extruded materials formed with microfibrils of one polymer dispersed in another polymer. The Perez et al discontinuous phase comprises microfibers not microfibrils**. Perez et al comprises materials including microfibers such as mats, films or foams; these materials are then laminated onto a substrate film, encased in a substrate or otherwise formed into an article. *See, e.g.,* Perez et al at Col. 12, l. 10 to Col. 33, l. 67.

Perez et al forms these microfibered materials using a number of different methods, but the principle method is to direct water or solvent jets onto highly oriented and crystallized films to form the microfiber materials. These methods are somewhat described in Perez et al, but are more fully described in patents incorporated by reference in Perez et al. Perez et al. also teaches stretching methods to orient and crystallize the polymer films so that the water treatment can separate the microfibers from the bulk material, but the microfiber materials are then generally subjected to some other method to form microfiber mats, films, foams or pulp.

Starting on Col. 6, line 12 and continuing to Col. 8, line 49, Perez et al does describe films made from blends of immiscible polymers: "an oriented polymer film comprising an immiscible mixture of a first polymer component and a void-initiating component . . ." Perez et al at Col. 6, ll. 15-17. The void-initiating component can be a solid or a polymer such as polystyrene or polymethylmethacrylate as set forth at Col. 6, ll. 26-34. Additionally, Perez et al does disclose that the films are either in the form of a continuous phase and a discontinuous phase (the void-initiating component is the discontinuous phase) or two continuous phases. In the case of the

continuous/discontinuous films, Perez et al give no information about the nature of the film except that the resulting voids formed during calendering, stretching, heating, annealing, recrystallizing, *etc.* will "remain as substantially discrete, discontinuous voids in the matrix of the continuous phase." Perez et al at Col. 7, ll. 48-50.

Nowhere in Perez et al is there any disclosure of an extruded film comprising a polymer alloy of at least two polymers, where one polymer is dispersed as microscopic fine fibrils in the other polymer. Moreover, nowhere in Perez et al is there any disclosure that the fine fibrils extend substantially in one direction, have mean widths and mean thicknesses less than or equal to about 5μm, are flat and are substantially parallel to the main surfaces of the film.

The Examiner points attention to Perez et al at Col. 10, lines 53 - 68 to support the rejection, but this section deals with foams not with extruded films. Foams included cells, which are air or gas pockets inside the polymer. In fact, Perez et al. states that about 70 % of the cells are closed (trapped within the polymer). Perez et al. at Col. 10, ll. 9-10. The stretching does indeed elongate the cells and makes them have X and Y dimension that are different, but they are not made up of a polymer, they are made up of a gas. Additionally, the films are not extruded with the elongated cells, the elongated cells are produced during stretching. These foams are simply and fundamentally different from a film comprising a dispersion of one polymer in a second polymer, where the dispersed phase comprise microfibrils.

Nothing in Perez et al discloses or even sufficient suggests to an ordinary artisan that a film could be produced during film extrusion that includes two polymers one dispersed in the second, where the dispersed polymer is in the form of microfibrils within the second polymer. Perez et al does not relate to microfibrils *per se*, but specifically to microfiber materials. Moreover, the two polymers of the present invention are both at least partly crystalline at temperatures less than 100°C. Furthermore, the Perez et al microfiber materials include: (1) microfibers on the surfaces of a film, (2) microfibers to a give depth into the film, or (3) microfibers throughout the entire film so that the film comprises "an entangled mass of microfibres." Perez et al at Col. 11, l. 61 to Col. 12, l. 9.

Furthermore, it is immaterial that the microfibers of Perez et al have specific dimensions (see Perez et al at Col. 12, ll. 10-31) as the microfibers are not formed during extrusion, but are formed by post extrusion treatments including surface fluid treatments, sonication treatments, and/or stretching treatments.

Because Perez et al. does not disclose an extruded film comprising a polymer alloy of at least

two polymers, where one polymer is dispersed as microscopic fine fibrils in the other polymer, Perez et al cannot anticipate claims 49 - 66, 96 and 98 -118.

Moreover, Perez et al does not even suggest to an ordinary artisan that such a film could be produced by simple extrusion. Perez et al forms the microfibers only after considerable post extrusion processing. While the present alloy films can be post processed, the nature of the film is formed during extrusion, where the film comprises microfibrils of one partially crystalline polymer dispersed in a second partially crystalline polymer.

5. **Claims 56 - 59 and 98 -118** stand rejected under 35 U.S.C. 102(b) as being unpatentable over Momose US Patent No 5,019,439.

The Examiner states and/or contends as follows:

> 6. Considering claims 56 - 59 and 98 - 118, Momose teaches an extruded oriented film comprising a layer of alloy of two polymers, the second resin corresponding to applicants P1 and the first resin corresponding to applicants P2. The first resin may be, for example, a polyolefin such as polyethylene or polypropylene, polystyrene, a polyacrylonitrile, polyester, a polycarbonate, poly vinyl chloride, or a modified resin thereof. The second resin may be, for example, a polyamide, a saponified ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer EVOH (Col. 3, lines 42 -48); both resins are partially crystalline under 100 oC (i.e. nylon 6 P1 and polyethylene P2, as described in example 2); wherein P2 in its unoriented state at 20 0 C exhibits a coefficient or modulus of elasticity more than 15 % lower than P1, and the alloy comprises a dispersion of microscopically fine fibrils (tapes) of P1 surrounded by P2. These fibrils or tapes extend each mainly in one direction and has width and thickness lower than 5 IJm; said fibrils are flat and substantially parallel with the plane of the film, with thickness preferably in the range 0.05 to 10 IJm and width more than five times the thickness (Col. 3, lines 1-21). Furthermore, that as result of the above described construction; the thermoplastic resin film can exhibit significantly improvement gas barrier property as compared with a known film having dispersed therein fine particles of the second thermoplastic resin (Col. 3, lines 23 - 28). Moreover, Momose teaches in the embodiment illustrated in Fig. 1 that the fibrils or tapes of resin P1 show at least 4 die lines. Thus anticipating all limitations in the subject claims.

Momose discloses films including tapes of one polymer in a second polymer. The tapes have widths of 75 μm or more and thicknesses in the range of 0.05 to 10 μm, **where the tape widths are at least 200 times their thicknesses**. Momose at Col. 3, ll. 3-4 (emphasis added).

The present microfibrils extend substantially in one direction, are flat, are substantially parallel with the main surfaces of the film, have a thicknesses less than or equal to about 1 μm, have a width at least 5 times the thickness, and have a mean of the width and the thickness less than or equal to about 5μm. Nothing in Momose even leads an ordinary artisan to attempt to prepare such a film as nothing in Momose suggests how the method of Momose could be modified to give rise to films having microfibrils as claimed in the present claims.

Because Momose does not disclose an alloy comprising microfibrils of a first polymer

dispersed in a second polymer, where the fibrils extend substantially in one direction, are flat, are substantially parallel with the main surfaces of the film, have a thicknesses less than or equal to about 1μm, have a width at least 5 times the thickness, and **have a mean of the width and the thickness less than or equal to about 5μm**, Momose cannot anticipate claims 56-59 of this invention. Applicant, therefore, respectfully requests withdrawal of this rejection.

Moreover, Momose cannot even render claims 56-59 obvious because Momose teaches directly away from the limitation that the microfibrils extend substantially in one direction, are flat, are substantially parallel with the main surfaces of the film, have a thicknesses less than or equal to about 1μm, have a width at least 5 times the thickness, and **have a mean of the width and the thickness less than or equal to about 5μm**. In fact, Momose expressly states that the width of the tapes are greater than or equal to 75 μm. Nothing in Momose suggest film having a mean of the width and the thickness less than or equal to about 5μm. The present invent claims microfibrils that have thicknesses less than or equal to about 1μm and widths at least 5 times the thickness, but the microfibres are further **have a mean of the width and the thickness less than or equal to about 5μm.**

Claim Rejections § 35 USC § 103

8. **Claims 60 - 66** stand rejected under 35 U. S. C. 103(a) as being unpatentable over Momose US Patent No 5,019,439 in view of Desarzens et al. US Patent No 6, 326,411 B1.

The Examiner states and/or contends as follows:

> 9. Considering claims 60 - 66, Momose teaches an extruded oriented film comprising a layer of alloy of two polymers, the second resin corresponding to applicants P1 and the first resin corresponding to applicants P2. The first resin may be, for example, a polyolefin such as polyethylene or polypropylene, polystyrene, a polyacrylonitrile, polyester, a polycarbonate, poly vinyl chloride, or a modified resin thereof. The second resin may be, for example, a polyamide, a saponified ethylene vinyl acetate copolymer, an ethylene vinyl alcohol copolymer EVOH (Col. 3, lines 42 -48); both resins are partially crystalline under 100 oC (Le. nylon 6 P1 and polyethylene P2, as described in example 2); wherein P2 in its unoriented state at 20 0 C exhibits a coefficient or modulus of elasticity more than 15 % lower than P1, and the alloy comprises a dispersion of microscopically fine fibrils (tapes) of P1 surrounded by P2. These fibrils or tapes extend each mainly in one direction and has width and thickness lower than 5 IJm; said fibrils are flat and substantially parallel with the plane of the film, with thickness preferably in the range 0.05 to 10 IJm and width more than five times the thickness (Col. 3, lines 1-21).
>
> Momose does not specifically recognize that the extruded oriented film be a cellular expanded film. Desarzens et al. teaches an extrusion composition comprising a polymer, an adsorption agent including an expansion agent and a nucleating agent (Abstract). Furthermore, Desarzens et al. also teaches that by means of polymer extrusion technology, cellular structure materials of very variable apparent densities can be produced (Col. 1, lines 16 - 19).
>
> It would have been obvious to one having ordinary skill in the art at the time the invention

was made to incorporate expanding agents to Momose's polymeric composition when it is desired to obtain films having apparent density lower than the density of the unexpanded films. The weight proportion of P1 to P2 would be a result effective variable related to the final application of the thermoplastic polymeric cellular expanded film.

Applicant reasserts its arguments relating to Momose here. The Examiner includes Desarzens et al. for the teaching of an expansion agent.

The combination of Momose and Desarzens et al. produces an expanded film, where one of the layers is a Momose layer including tapes of a first polymer in a matrix of a second polymer, where **the tapes have a width of greater than or equal to 75 μm** and the film includes an expansion agent, but the film does not include microfibrils that have thicknesses less than or equal to about 1 μm and widths at least 5 times the thickness, but the microfibres are further **have a mean of the width and the thickness less than or equal to about 5μm**.

Because the combination of Momose and Desarzens et al. does not disclose or even suggest films the film does not include microfibrils that have thicknesses less than or equal to about 1 μm and widths at least 5 times the thickness, but the microfibres are further **have a mean of the width and the thickness less than or equal to about 5μm**, the combination cannot render claims 60 - 66 obvious. Applicants, therefore, respectfully request withdrawal of this rejection.

Response to Arguments

The Examiner states and/or contends as follows:

10. Applicant's Amendments and Accompanying Remarks filed on October 06, 2010 has been entered and carefully considered. Claims 1 - 44, 67 - 95 and 97 have been canceled. New claims 98 -118 have been added. In view of argument and amendment, the Examiner has withdrawn the rejection of claims 49 - 55 and 96 over Momose as detailed in the Office Action dated July 06, 2010. The invention as currently claimed is not found to be patentable for reasons herein above.

Applicant's arguments with respect to claims 49 - 66 and 96 have been considered but are moot in view of new grounds of rejection.

Applicant acknowledges the Examiner's statement and contentions and asserts that the current claims are patentably distinct over Perez et al, Momose and the combination of Momose and Desarzens.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W.Strozier at 713.977.7000

The Commissioner is authorized to charge or credit Deposit Account 501518 for any additional fees or overpayments.

Respectfully submitted,

Date: **9 May 2011**

/Robert W.Strozier/

Robert W.Strozier, Reg.No.34,024